IMPLEMENTING SYSTEMATIC PROJECT PLANNING

What is systematic project planning?

Systematic planning is the process for defining an adaptive strategy and approach that can be used on projects to achieve site closure and reuse as quickly as possible. It focuses on determining where a project is going, how it is going to get there, and how will it be determined when the objective is met. The environmental community has long recognized the value of systematic project planning as reflected in the EPA's data quality objective (DQO) process, the U.S. Army Corps of Engineers' (USACE) *Technical Project Planning (TPP) Guidance* (USACE 1998), the U.S. Air Force's *Performance-Based Management Master Guidance* (November 2005) and others. In many cases, there can be misunderstandings about what type of planning is being conducted on a project because of the differences in nomenclature used by different federal agencies and departments.

In this document the Systematic Planning Process (SPP) is defined as the planning process that is based on the scientific method and includes planning management of the many non-scientific issues that impact site cleanup, such as uncertainty about budgets and contracts, stakeholder interests and fears, legal concerns, and regulatory interpretation. To be effective SPP must address all uncertainties that affect how a project's end goals are framed, shaping the decisions that must be made to bring the site to closure and reuse (Remediation 2005).

What are the fundamental requirements of SPP?

SPP encompasses activities that extend beyond data collection to determine compliance with some action level or cleanup goal. During SPP, the site conceptual model (CSM) is used to help evaluate site reuse options, guide remedial design, and develop long-term monitoring strategies. Effective SPP consists of several activities, including:

- Stakeholder involvement - building "social capital", a cohesive team of project stakeholders (such as site owners, regulators, community members, and technical specialists) suited to address site-specific problems
- Identification of project objectives/goals - development of clear objectives for site closure based on property re-use scenarios or known end uses and likely site remedies (i.e. site exit strategy). The project objectives drive the decisions that need to be made along with uncertainties that affect them. These objectives are identified based on the information in a CSM.
- Design of sampling and data management activities to achieve project objectives - stakeholders identify data needs based on the CSM, and develop strategies to collect and evaluate data needed to manage the principal sources of uncertainty that affect decision-making within the constraints of the project.
- Design of site closeout, remediation approach, performance objectives, and metrics – stakeholders identify likely site closure scenarios and remedial options based on the CSM. From this, strategies to implement, monitor performance, optimize, and shut down can then be developed.

While there is no checklist for performing SPP, the process should address the following key considerations:

- Building social capital among project stakeholders
- Clearly identifying project objectives and site exit strategy
- Identifying constraints such as budgets, timelines, and logistics
- Developing a CSM and defining potential exposure scenarios
- Addressing data and resource needs
- Identifying project boundaries and decision criteria
- Developing acceptable levels of uncertainty
- Understanding technical limitations of proposed sampling and remedial technologies
- Agreeing on ARARs and time frame for achieving them
- Developing approaches for managing programmatic and project non-scientific and scientific uncertainties
- Translating project needs into sampling, analysis, and decision-making requirements

SPP can be applied to individual sites or to entire installations. For federal facilities, the individual site systematic planning process must comply with the master installation-wide strategic plan

What does an SPP session look like?

An SPP session can take many forms based on team preferences, schedule, site complexity, and location. Typically, a session will be in the form of a meeting of the whole team that takes 1-3 days. Although there is a benefit to having the whole team present throughout the session, support team members could attend parts of the meeting or be available for questions at certain times depending on their schedule. Key team members should be present for the entire session. Rather than engaging in consecutive days of planning, teams can also elect to break up the sessions into smaller meetings or teleconferences.

Regardless of the format, SPP sessions include the following:

- Introduce and clearly define participant roles/responsibilities
- Identify meeting and project objectives
- Establish expectations and ground rules of group
- Identify existing sources of information
- Articulate the CSM
- Identify and gain consensus on key project uncertainties and contingencies
- Define acceptable levels of uncertainty and discuss technical limitations of strategies
- Translate into existing information review, sampling, analysis, and decision-making requirements

- Provide mechanism for decision-making when consensus is not achievable
- Identify and track action items
- Establish tentative project schedule

The following items are essential points to cover in SPP discussions:

Regulations and Guidance

- What is the regulatory framework within which action(s) are being taken?
- What pertinent guidance exists (e.g., if RCRA, what current RCRA guidance exists that will be relevant to any action taken. For groundwater actions see http://www.epa.gov/superfund/resources/gwdocs/)?
- What documentation is required for the regulatory framework?
- What types of review (i.e., regulatory, in-house legal, etc.) will be required throughout the process?
- What are the site ARARs?
- Will any ARAR waivers be required?
- Where are the points of compliance?

Stakeholders (if they hold a veto, legal or otherwise, they are a stakeholder)

- Who is funding the effort?
- Who has overall responsibility for the project?
- Who has day-to-day responsibility for the project?
- Who are the regulators?
- Who is providing technical support and/or technical review?
- Who are the public stakeholders?

Conceptual Site Model

- What information is currently available pertinent to the contamination status of the site?
- What are the project boundaries? Are there individual sites that all contribute to a larger site?
- Are there off site sources or other factors that can affect contaminant fate and transport or remedies on site?
- What are the contaminants of concern or potential concern?
- What are the potential receptors under current and reasonably expected future exposure pathways?
- What is the site geology and hydrogeology?
- What are the contaminant fate and environmental transport mechanisms? Geochemical conditions? Biological conditions?
- Has a risk assessment been performed, and if not, is one required?
- Are there residual sources contributing to a groundwater plume? How are source areas being defined? Does the site have a DNAPL source?
- What is the groundwater use designation?

- What are the contaminant levels that require action, what is their technical basis, and how are they defined? If they are default target levels will additional information be used to refine these levels?
- What past remedial actions and locations of remedial components and monitoring points?
- What are all historical, current, and expected future land uses?
- What are the decisions that will need to be made?
- Where are the sources of uncertainty within the CSM that prevent decisions from being made based on existing information?
- Which of those uncertainty sources can be addressed by data collection?
- Can data be collected using a dynamic work strategy? If so, how will this be done?
- What decision uncertainty cannot be addressed by data collection? What contingencies are required to address this uncertainty?

Exit Strategy

- What is the exit strategy for the overall project (note components may vary based on the stage of CSM development)?
  - What are the environmental conditions that pose an unacceptable risk that requires remediation?
  - What are the remedial action objectives (RAOs) that must be met to mitigate the risk?
  - What is the means selected to achieve the objectives?
  - What are the metrics to be used to demonstrate success?
  - What are the required post closure actions?
- What are the agreed to land use and risk management strategies?
- How does the site exit strategy translate into project decision logic?
  - What is the program level decision logic and how does it link to project level decision logic?
  - What is the project level decision logic?
  - How do goals for individual sites impact each other?
  - Are there logical interim actions to take?
  - What is the field level decision logic?
  - Who needs to be involved at various decision points?
- How will decision logic be documented?

Remedy

- What is the proposed future land use for the project?
- What precedents exist for problems of this sort either on-site or at similar sites?
- Is there a presumed remedy that will most likely be implemented, if remediation is necessary?
- What are the information requirements necessary for documenting closure?
- What is the probability of the remedy failure and what is the consequence of failure?
- Would the RA benefit from a phased combined technology approach?

Project Planning and Management

- Who constitutes the core planning team for the project (i.e., who will actively participate in planning and decision-making)?
- What are the team's expectations for the systematic planning process?
- Does this project have linkages with other planned, on-going, or completed projects on site? If so, what are those linkages?
- What is the overall project strategy?
- What constraints are known that might affect project strategy (e.g. budgetary, programmatic, real-estate access, procurement, schedule, past precedent, litigation potential, etc.)?
- How can a dynamic work strategy be implemented using real-time techniques to address data gaps?
- What is the logical sequence of activities to address data gaps in an efficient manner?
- Is there a way to compress activities required to achieve exit strategy?
- What are the analytical and/or measurement options for addressing data gaps?
- What contract mechanisms are available to execute the work and are they the most suitable for the project?
- What will the documentation process look like to support the strategy (e.g., types of documents, purpose, review requirements, etc.)?
- What is the project communication strategy? What decisions do individual stakeholders need to weigh in on? Will decision support tools be utilized?

When is SPP performed?

SPP is practiced throughout a project, and not just in the beginning phases. SPP is also an iterative process that continues as the site CSM evolves. The concepts of building social capital, defining exit strategies, developing a CSM, and defining potential exposure scenarios are applicable to any type of environmental remedial project. These range from those for site assessment and investigation, to cleanup design and implementation, and to long-term operations and monitoring. For example, for a site that is looking to achieve closure, SPP can be used to bring together the key stakeholders needed to agree on the steps to reaching closure, even when those steps do not include performing additional field activities.

How does SPP build social capital among project stakeholders?

The "human factor" on projects is as integral to successful SPP as technological and scientific ones. To address this, SPP is performed using teams. By jointly developing consensus on overall strategy, identifying issues that could reasonably impede successful site development, proposing likely solutions for impediments and contingencies, the team ensures that needs and expectations are identified up-front and that rework to meet these expectations later is minimized. The teams should communicate the practical limitations of modern analytical and remedial technologies to develop strategies that can lead to achievable project successes.

The core team includes representatives of the responsible party, regulatory agencies, local groups or organizations, and technical expertise resources. Planning for environmental projects includes a wide variety of individuals and institutions, including project management and technical personnel, legal support, customers, suppliers, contractors, scientific experts, and other stakeholders, who together will determine if the project is successful. All members of projects that can support consensus-based decision-making should be included. For the team to be successful, participants must be committed to work through technical issues in a non-adversarial manner. Successful teams are also ones where there is membership continuity over the life-cycle of a project, since the team will embody a collective understanding of the technical and political basis for work done to date, and work proposed for the future. The end result of the team-approached planning is that the team identifies the decisions to be made, along with known and missing information and determines what information must be collected to support quality decision making activities.

One example of a team might include Federal Facility personnel (e.g., base personnel, contract managers, contractors) which meet in a scoping meeting with their counterparts in regulatory agencies to develop the plan for environmental data collection. Other members including technical experts in human health and ecological risk assessment, hydrogeology, chemistry, and quality assurance, contracting, legal support, and remedial design, may participate in the process, either in team meetings or in consultations behind the scenes. Other members might include individuals from the community. Community stakeholders participate in the process through routine briefings and public meetings on the proposed team approach. The best way to incorporate community input in the systematic planning should be determined at the beginning of the project.

Project managers should facilitate stakeholder involvement and commitment throughout the project, particularly during field activities so that concerns can be managed and addressed in real time. Stakeholder involvement early in the process and continuing as the project is ongoing is crucial to avoiding disputes or last minute surprises associated with stakeholder concerns. These agreements on approach are especially critical if dynamic strategies are being used in the field that require real-time decision making. Increased involvement of the project manager and senior project staff at critical times or delegating greater decision-making power to the field technical team is also necessary to ensure quality field investigations are conducted with optimum efficiency.

What should the project objectives/goals discussions include?

It is critically important that project stakeholders agree on project objectives/goals before development of a project plan. Without a clear project objective, the path to site closure and how uncertainties are managed with respect to the project objectives cannot be developed. The following are examples of the types of questions that often are considered during development of project objectives:

- What are the potential sources and other environmental issues at the site?
- What are the potentially-impacted media and receptors?

- What is the planned reuse?
- Who is responsible for cleanup of the site?
- What are the appropriate cleanup levels for the site?
- Is there sufficient data to support closure?
- What data are needed to support implementation of potential remedies?
- Do viable treatment or containment technologies or other alternatives exist?
- What is the preferred remedial alternative?
- What is the estimated cost for redevelopment of the site?
- What is the economic viability of cleanup?
- What data are needed to evaluate remedy effectiveness, once implemented?
- How can closure be documented?
- How can system performance be optimized and operating costs be reduced?
- What contingencies need to be established to ensure objectives are being met?

What does managing uncertainty mean in systematic planning?

Effective SPP requires the management of decision uncertainty beginning with all parties agreeing on what the project decisions should actually be. Once the project objective are define, decision uncertainty can then be developed with respect to these objectives in the context of achieving site closeout. Uncertainties on projects have many forms, including:

- Contaminant and media heterogeneity
- Whether risk pathways are complete
- Investigation and remedial techniques
- Schedule and budget
- Future land uses
- Attitudes and positions of the public

SPP works to describe the uncertainty in terms that allow it to be resolved and prioritized such that meaningful answers can be obtained, decision makers can define levels of tolerable uncertainty to the decisions, and judgments can be made concerning the adequacy of the answer.

What are the Benefits to Using Systematic Planning Process?

There are certain benefits that result from using a Systematic Planning Process. The benefits include:

- Encouraging comprehensive, careful planning by soliciting input from concerned customers and stakeholders;
- Addressing costs and schedule in the design phase, the critical time to address total project constraints;
- Communicating and documenting proposed activities and decisions to be made so that *everyone* has a common understanding of requirements when considering the data collection or work design, strategies, and the end use of products;

- Addressing the concerns of customers, suppliers, and relevant technical experts for products, services, and activities, thus minimizing the possibility of repeating work because of inappropriate or inadequate project implementation; and
- Facilitating the application of promising innovative technology by reconciling technology capabilities with site-specific considerations.
- Identifying contractual mechanisms that facilitate the use of dynamic work and performance based strategies
- Identifying and planning contingencies for innovative technologies and approaches

What comes out of the Systematic Planning Process?

The primary products of SPP sessions are a written identification of the strategy to execute the regulatory process through closure, and a framework that uses dynamic decision logic to resolve outstanding uncertainties that can be addressed through information/data collection. There are several ways to document the progress of the Systematic Planning Process depending on how the sessions are run, i.e., correspondence, after action reports, progress reports, and meeting or planning minutes.

Once the SPP sessions are completed, project specific products of the SPP can be developed including living Conceptual Site Models, Dynamic Work Strategies, Demonstrations of Methods Applicability as necessary, and Standard Project Planning documents (Quality Assurance Project Plans, Field Sampling Plans, and Environmental Health & Safety documentation, Standard Operating Procedures, etc.)